Patent claims

1. A process for precision-machining a cylindrical inner surface, in particular a cylinder bearing surface, in which the cylindrical inner surface is subjected to at least one preliminary honing step and a precision-honing step, characterized
   - in that the cylinder bearing surface has material of different hardnesses in the axial direction,
   - in that the preliminary honing step produces a cone (11) in the cylindrical inner surface, in such a way
   - that the cone (11) widens out from a harder region (4) toward a softer region (6), and
   - in the subsequent precision-honing step, the cone (11) is compensated for again in the harder region (4) to produce a cylindrical inner surface, and
   - the cone (11) is retained in the softer region (6).

2. The process as claimed in claim 1, characterized in that the cone (11) of the cylindrical inner surface is produced by a honing stone (8) which runs conically with respect to the said inner surface.

3. The process as claimed in claim 1, characterized in that the cone (11) is produced by adjusting the honing parameters.

4. The process as claimed in claim 3, characterized in that the cone (11) is produced by adjusting the advance (V) of a honing tool (7') in the axial direction (9) and/or by

adjusting the contact pressure (P) of the honing tool (7') against the cylindrical inner surface.

5. The process as claimed in one of claims 1 to 4, characterized in that a honing tool (18) is used with different types of honing stones (20, 22) which are deployed selectively for the preliminary honing step or precision-honing step or which are deployed selectively for different regions (4, 6) of the cylindrical inner surface.

6. The process as claimed in one of claims 1 to 5, characterized in that the cone (11) is introduced over a length (10) of from 20 mm to 200 mm in the axial direction (9), and a change (12) in the radius of the cylindrical inner surface of from 10 µm to 100 µm is established over this region.

7. The process as claimed in one of claims 1 to 6, characterized in that a second, opposite cone (30) is introduced into the softer region (6), so that a convex shape (28) is established in the softer region (6).